

REFUTATION OF RECENT CREATIONS OF
MICROSPECIES AND HYBRID TAXA IN
ARGENTINIAN *SOLANUM* (SECT. *PETOTA*)

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ABSTRACT

Arguments are presented against taxonomic splitting within *Solanum* from Argentina.

KEY WORDS: *Solanum*, Solanaceae, evolution, hybrids, Argentina.

In recent years, we have been confronted with the splitting of well established taxonomic units of Argentinian wild potatoes and the proliferation of so-called "*spec. nov.*" of hybridogen origin. This deplorable tendency has created further problems for the understanding of the speciation of *Solanum*, a genus which traditionally suffers "*per se*" evolutionary and nomenclature problems.

When working with wild potatoes, one should always bear in mind the biological fact that the majority of diploid tuber bearing species are necessarily outbreeders. Consequently, their sexually produced offspring are not identical, but show (more or less) morphological and physiological segregation, which in extreme cases may simulate speciation. Their self incompatibility is based on a rather simple S-allele scheme (oppositional factors of multiple genes, at the same chromosome locus) which inhibits self fertilization. This important fact should never be overlooked by wild potatoes collectors and should be borne in mind by taxonomists in their zeal to immortalize their names in the description of new species. Unfortunately, this problem arose recently in Argentina. Members of several series of tuber bearing *Solanum*, such as *Acaulia*, *Cuneolata*, *Megistacroloba* and *Tuberosa* were involved in an undue "name creation." We hope that those procedures may be discontinued. With regard to this, we may call attention to some recent publications (Okada & Hawkes 1978; Okada & Clausen 1982; Okada & Clausen 1985).

In sect. *Petota*, there is a "two way system of propagation:" sexual reproduction and vegetative clonal proliferation. To a certain degree, these have opposing effects on the frequency of genomic variability. Whereas sexual reproduction encourages a limited genetic segregation and diversity of given wild

potato species, asexual reproduction has a more conservative effect. With the former process, self sown seedlings may cause a continuous slight segregation inside the offspring generation, apparently leading to "microspecies," while the latter process of asexual-clonal reproduction allows survival of a chain of milieu adapted hybrid plants and many nothomorphic forms. This was already explained by Brücher in 1953 (the first case for Argentina).

Even genetically infertile *Petota* hybrids, or sterile introgression biotypes can maintain, by asexual reproduction, their identity for a long time, perhaps for ages.

Of course, between segregations and hybrids of this sort, neither can claim higher taxonomic status, nor do they deserve—in the light of a modern biological species concept (Löve 1964)—any botanical name. Hawkes f.e. was quite right when he once expressed: ". . . If these hybrids are to be named at all, they should be considered merely as nothomorphic forms of one species" (1963 p. 155). After having rejected his earlier, now outdated species concept, Hawkes wrote recently (1989 p. 58): ". . . in general the wildpotato species should be regarded as larger units that contain a wide range of genetic diversity. . . Such concept made it inadvisable, if not impossible, to divide potato species into the conventional infraspecific categories of varieties and forms." Similar thoughts have been repeatedly expressed by other solanologists (Correll 1962; Danert 1962; Dodds 1965; Ochoa 1984).

Therefore, we wonder why there exists such a wide gap between good theories and objectionable practice related to Argentinian wild potatoes.

PART I

a) Hybrid: *Solanum rechei* Hawkes & Hjerting

This "species" has a rather curious history, which began 60 years ago when the botanist Dr. Castellanos collected, in a farmer's settlement (Guanchín Viejo) situated in the semiarid Dept. Chilecito (Prov. La Rioja), an apparent wild potato (now included in the herbarium of the Museum B. Rivadavia, BA, as number 28/345 BA). The locality, at 29° S, 67° 38' W, is easily accessible by a side road, 10 km from the town of Chilecito. The plant was claimed by Hawkes & Hjerting (1963) to be a new species. It received the binomial *Solanum rechei*, so called in attention to a friend of the latter author, who was at that time a merchant in Tucumán.

The short species diagnosis (1963 p. 146) claims a close phylogenetic affinity to *Solanum maglia*, a true species of long standing, which grows on the Pacific coast of the Chilean Republic.

The authors considerably underestimated the geographic distance (700 km) between the "*loci classici*" of the two epithets. Possibly, the similarity of names, Chile-Chilecito (which means little Chile) interfered subconsciously in

the minds of the foreigners who created this new species and committed the incredible gaffe of declaring *Solanum rechei* as the ancestral form of *Solanum maglia*, a species which lives on the Pacific coast, in Chile, separated from the former by the high Cordillera.

The term *S. rechei* has been created under the erroneous assumption of representing another endemic species of the Sierra Famatina (*l.c.* Brücher 1959; 1965), a very extended mountain chain of difficult access, with a maximum elevation of 6200 m.

Furthermore, the statement in the description that indicates that *S. rechei* occurs on several distant places of dry valleys in the province of La Rioja is not true. The truth, as we found out during several collecting trips to La Rioja, is that the so called *S. rechei* has a narrowly restricted manmade habitat in orchards of irrigated agricultural farms, called Guanchín Viejo, Las Tablas, Trapiche and a picnic place on the local automobile road from Chilecito to Mina de Oro. Our checking disproved completely, the pretention of the foreigners to have discovered a new species of *Solanum*. The results of several days inspection of the original locality and a comprehensive plant collection of more than 100 samples (available at our private herbarium in Mendoza), indicate that these "papas malezas" (= weed potatoes), as the local people quite correctly defined them, are the remainders of an earlier hybridization between *Solanum microdontum* (*sensu lat.*) and *Solanum kurtzianum*, two well known wild potatoes.

Although this has been already published in two short notices in German in 1969 and 1974, the authors of *Solanum rechei* did not eliminate their erroneous epithet, while they partially admitted their error and recognized the poor taxonomic value of this name in their book on Argentine wild potatoes (Hawkes & Hjerting 1969). But the last publication on the subject (Okada & Hawkes 1979) restores the erroneous name with the statement "*Solanum rechei* Hawkes & Hjerting es una papa silvestre. . ."

To maintain a "holotype" of *S. rechei* is misleading because Nr. 28/345 at BA is a casually segregated individual from a huge hybrid swarm of uncounted different morphotypes. We discovered this when we collected at random, hundreds of plants in the orchards and at irrigation ditches of Guanchín Viejo. None of the plants matched the others. Neither should they be named "F₁ plants" (Hawkes) because there is no proof of how and when such hybrid F_n populations arose. Keeping in mind that these orchards have been kept under irrigation for hundreds of years, and are plowed and harvested each year, the tubers of these hybrids swarms of F_n origin have been mixed and diffused by repeated cleaning and weeding of the irrigation ditches.

The following table is a testimony to the heterogeneity of such "papas malezas." This is only an abbreviated extract from our findings which shall be presented "*in extenso*" on another occasion.

Publication of Part II follows in short.

Table 1

Nr. of Collection	Plant Height in cm	Length X Width of Terminal Leaflet in mm	Quantity of		Stem Wings	Flowers ¹
			lat ² lfsts	int ³ lfsts		
1400	32	60 X 45	2	4	yes	#
1401	36	75 X 30	3	4	no	&
1402	40	40 X 25	4	6	no	&
1403	45	45 X 30	3	10	no	&
1404	40	30 X 22	4	12	no	&
1405	30	40 X 20	4	4	no	&
1406	40	50 X 20	4	8	yes	&
1407	22	45 X 22	4	6	no	%
1408	28	60 X 30	2	3	no	#
1409	22	40 X 18	5	8	no	#
1410	60	44 X 20	3	6	no	#
1411	18	40 X 20	2	2	no	#
1412	30	45 X 35	3	2	yes	#
1413	38	60 X 40	2	2	yes	#
1414	100	130 X 45	2	0	yes	#
1415	50	70 X 28	3	3	yes	#
1416	38	90 X 55	1	0	no	#
1417	25	80 X 60	1	0	no	#
1418	20	60 X 40	1	0	no	#
1419	16	70 X 55	2	0	no	#
1420	80	65 X 40	3	7	yes	#
1421	120	85 X 60	3	5	yes	&
1422	90	70 X 45	3	5	no	#
1423	108	65 X 30	4	7	no	#
1424	110	65 X 25	4	6	yes	#
1425	95	70 X 30	3	4	yes	%
1426	90	60 X 35	3	4	yes	#
1427	98	70 X 40	4	8	yes	%
1428	80	80 X 40	3	5	yes	%
1429	100	110 X 450	2	4	yes	&
1430	120	95 X 335	3	4	yes	&
1431	100	90 X 35	4	8	yes	&
1432	110	65 X 25	4	5	yes	%

Table 1 (cont.)

Nr. of Collection	Plant Height in cm	Length X Width of Terminal Leaflet in mm	Quantity of		Stem Wings	Flowers ¹
			lat ² lfsts	int ³ lfsts		
1433	90	50 X 20	4	3	no	#
1434	100	70 X 30	3	8	yes	%
1435	110	60 X 30	4	11	yes	%
1436	120	55 X 25	3	7	yes	#
1437	120	70 X 35	4	12	yes	#
1438	60	60 X 35	3	5	no	#
1439	100	85 X 45	4	6	no	#
1440	90	70 X 30	4	3	yes	%
1441	120	65 X 25	4	7	yes	&
1442	22	70 X 30	3	3	yes	#
1443	28	45 X 25	2	0	yes	#
1444	25	40 X 18	2	0	yes	#
1445	70	90 X 35	2	0	yes	%
1446	80	100 X 40	2	7	no	#
1447	90	90 X 40	3	2	yes	&
1448	20	80 X 40	2	3	yes	#
1449	120	90 X 60	3	6	no	#
1450	100	100 X 60	2	3	no	#
1451	130	75 X 33	3	7	yes	#
1452	140	115 X 45	4	6	yes	#
1453	80	70 X 35	3	3	yes	#
1454	90	65 X 30	2	3	no	%
1455	28	55 X 25	3	4	yes	#
1456	120	95 X 45	4	6	yes	#
1457	100	100 X 55	3	5	yes	&
1458	110	90 X 45	3	9	yes	#
1459	130	90 X 35	3	4	yes	&
1460	110	90 X 50	2	6	no	#
1461	80	75 X 35	3	0	no	%
1462	70	75 X 45	3	3	no	#
1463	90	85 X 40	3	7	no	#
1464	100	110 X 55	3	6	no	#
1465	120	80 X 35	4	5	yes	#
1466	25	55 X 40	1	0	no	#
1467	12	50 X 30	1	0	no	#
1468	15	55 X 25	2	0	yes	#

Table 1 (cont.)

Nr. of Collection	Plant Height in cm	Length X Width of Terminal Leaflet in mm	Quantity of		Stem Wings	Flowers ¹
			lat ² lfsts	int ³ lfsts		
1469	20	75 X 50	1	2	no	#
1470	12	50 X 30	1	0	yes	#
1471	14	40 X 35	1	0	no	#
1472	20	40 X 30	3	0	yes	#
1473	30	60 X 35	2	1	yes	#
1474	20	60 X 45	2	0	yes	#
1475	12	55 X 35	1	0	yes	#
"Holotype"						
345	-	70 X 30	3	1	yes	&

¹ & stands for present; % stands for aborted; # stands for absent.

² lateral.

³ interject.

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